High Performance Spaceflight Computing - Implementation (HPSC-I)

Active Technology Project (2011 - 2024)

Project Introduction

Space-based computing has not kept up with the needs of current and future NASA missions. This project is developing a next-generation flight computing system that addresses computational performance, energy management and fault tolerance needs of NASA missions through 2030.

Anticipated Benefits

- New flight computing architecture
- 100X the computational capacity of current flight processors for the same amount of power
- Unprecedented flexibility to trade among computational performance, energy management and fault tolerance
- Highly extensible; chiplets can be cascaded together and/or configured with specialized co-processors

Primary U.S. Work Locations and Key Partners

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Organizations Performing Work	Role	Type	Location
★Game Changing Development(GCD)	Lead Organization	NASA Program	
Alphacore, Inc.	Supporting Organization	Industry	Tempe, Arizona
●Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California
BAE Systems	Supporting Organization	Industry	Nashua, New Hampshire
●Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland
●Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California
●Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas
University of Arizona	Supporting Organization	Academia Alaska Native and Native Hawaiian Serving Institutions (ANNH), Hispanic Serving Institutions (HSI)	Tucson, Arizona
Vanderbilt University	Supporting Organization	Academia	Nashville, Tennessee

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Game Changing Development (GCD)

Responsible Program:

Game Changing Development

Project Management

Program Director:

Mary J Werkheiser

Program Manager:

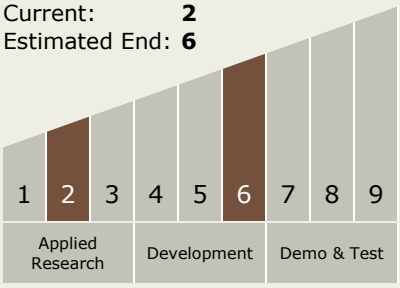
Gary F Meyering

Project Manager:

Charles E Dunn

Technology Maturity (TRL)

Start: **2**
Current: **2**
Estimated End: **6**



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Co-Funding Partners	Type	Location
Air Force Research Laboratory(AFRL)	US Government	Notre Dame, Indiana
Exploration Capabilities	NASA Program	
Planetary Science	NASA Program	
Small Business Innovation Research	NASA Program	

Primary U.S. Work Locations	
Arizona	California
Maryland	Michigan
New Mexico	Tennessee
Texas	Virginia

Project Website:

https://www.nasa.gov/directorates/spacetech/home/index.html

Technology Areas

Primary:

- TX02 Flight Computing and Avionics
  - TX02.2 Avionics Systems and Subsystems
    - TX02.2.1 Spacecraft Command and Data Handling Systems (C&DH)

Target Destinations

Earth, The Moon, Mars

Supported Mission Type

Projected Mission (Pull)